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Before the Board of Patent Appeals and Interferences

APPLICANTS:	La Porta et al.		EXAMINER:	Ricardo M. Pizarro	
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TITLE:	MULTIPLE-PROTOCOL HOME LOCATION REGISTER AND METHOD OF USE				

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to Commissioner for Patents, Mail Stop Appeal Brief-Patents, Group Art Unit 2661, **Attention: Ricardo M. Pizarro**, P.O. Box 1450, Alexandria, VA 22313-1450, on February 16, 2007.

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APPEAL BRIEF

Dear Sir:

This Appeal Brief is submitted (in triplicate) to follow the Notice of Appeal filed June 1, 2006 and stamped as received June 1, 2006 by the U.S. Patent and Trademark Office in connection with the above-designated application. A Credit Card Payment Form is attached hereto authorizing a payment of $500.00 for the Appeal Brief. **A Notice of Appeal fee was previously paid on June 1, 2006 (see attached proof of payment).**

I. REAL PARTY IN INTEREST

The Real Party in Interest in this matter is Lucent Technologies, Inc., of Murray Hill, New Jersey, USA

II. RELATED APPEALS AND INTERFERENCES

There are no related Appeals or Interferences currently pending in this matter.

III. STATUS OF CLAIMS

Claims 1, 3, 4, 7 through 18, 34, 36, 37, 39, and 40 are currently pending in this Application. Applicants are appealing the final rejection of these claims. Claims 2, 5-6, 19 through 33, 35, and 38 have been canceled.

IV. STATUS OF AMENDMENTS

An Amendment was filed in the above-captioned matter on May 8, 2006, canceling claims 20 through 33. No other amendments have been filed subsequent to final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention provides, in effect, a "super" Home Location Register (HLR) for mobile telephony that performs mobility, authentication, and profile management functions for different network types from a common source of data and control procedures. This is accomplished by defining core data types and control procedures that can be projected in different formats to different network types. The networks supported include, but are not limited

to, GSM, ANSI-41 cellular networks, Internet telephony networks based on SIP or H.323, and Mobile IP-based networks.

This development gives the Assignee an advantage with service providers migrating from second generation to third generation networks, and for service providers building wireless data networks. The main benefits are: (1) a single user profile may be managed by a service provider for subscribers that use multiple access networks (e.g., wireless and Internet); (2) subscribers will have access to consistent services regardless of their current location or access network; (3) subscribers may seamlessly move across network types; and (4) service providers may interwork second and third generation networks as well as cellular networks and Internet telephony networks.

The Super HLR, as it is called, performs (1) mobility/user location management; (2) user authentication/security control; and (3) user profile management functions for different network types. For GSM phone users, the Super HLR is viewed as GSM HLR and AuC (authentication center). For AMPS/PCS phone users, it works as an ANSI-41 HLR/AC (authentication center). For VoIP/SIP users, it provides SIP registrar and proxy server functionality. It also supports AAA (authentication, authorization, accounting) server functions to IP wireless users as well as Internet users.

Two different embodiments of an MP HLR are described herein. One embodiment utilizes protocol gateways that interpret network requests and generate, utilizing a common control procedures for multiple network protocols, queries to a database that provides a common source of data for all networks.

A second embodiment utilizes a mediation device that generates and/or translates network messages according to multiple different network protocols and is coupled to multiple HLRs, each supporting a different one of the multiple network protocols.

A block diagram of the second embodiment of a multiple-protocol HLR is shown in FIG. 4. This embodiment of the MP HLR 101 includes an HLR for each type of wireless communication system and a server for each type of wireline network supported by the MP HLR 101. In the particular example shown, a GSM HLR 401 and an ANSI-41 HLR 403 are shown. Each of the HLRs 401 and 403 are interfaced to a mediation device 405.

The mediation device (MD) 405 provides a number of functions, including generating network messages, translating network messages, and emulating GMSCs, VMSCs, and MCs. As part of the translation function, various tables including translation information are included in the MP HLR 101. An example of such a translation table is shown in TABLE 1, which translates messages between GSM and ANSI-41/ANSI-136.

The MD may also convert messages. For example, the MD 405 may convert a Provide Roaming Number message to a Location Request message or a Routing Request message to a Send Routing Information message. When looking at conversion external to the MP HLR 101, the MP HLR 101 converts a Location Request message to a Provide Roaming Number message, and also converts a Send Routing Information message to a Routing Request message. The MP HLR 101 works with serving networks, i.e., networks where communication devices are currently registered, to update registration information, generate queries in response to requests, and route calls to users where they are located and in a manner that users access their communication devices, such as formatting profiles and messages according to the serving or

terminating network's protocol. The MP HLR 101 routes a call according to the protocol of the infrastructure device to which the call is directed.

In this embodiment, a provisioning gateway 407 preferably distributes user data for each of the devices within the MP HLR 101. The provisioning gateway 407 is interconnected to a database (not shown) that is part of or external to the MP HLR 101, or distributed among one or more of the MP HLR 101 components. Only two HLRs are shown part of the MP HLR in FIG. 4 for the sake of simplicity. If additional HLRs or home agents were to be added to the MP HLR, each such device would be interfaced to the mediation device 405 and the provisioning gateway 407. The database includes user information such as user profile, locations, and security information, such as the data stored in the database 201 as described above. Other stored data includes protocol types and addresses for communication devices, serving networks, and infrastructure devices such as gateway MSCs, terminating MSCs, visited MSCs, packet gateways, and internet protocol gateways. This data may be distributed as needed among the elements that require the information or may be stored for access as needed at various devices, such as the provisioning gateway 407 or the mediation device.

FIG. 7 is a flowchart and timing diagram showing call delivery originated in GSM and terminated in ANSI in accordance with the invention. FIG. 8 is a flowchart and timing diagram showing call delivery originated in ANSI and terminated in GSM in accordance with the invention.

One should note that a call, such as an IAM (Initial Address Message) or SIP invite, is delivered to the call processing entity governing the called party number. If the called party number is a SIP URL, the call is delivered to an SIP proxy. If the called party number is a GSM

or ANSI-41 wireless phone number, the call is delivered to a GSM GMSC or an ANSI-41 home MSC, respectively. A VoIP server, for example, may use SIP (Session Initiation Protocol).

A flowchart and timing diagram showing call delivery originated in GSM and terminated in ANSI is shown in FIG. 7. An IAM including a called party number (PN) is sent to a GSM GMSC, which sends routing information to the GSM HLR 401 of the MP HLR 101. The GSM HLR 401 determines the VMSC (Visited Mobile Switching Center) type for the called party. When the type is GSM, normal GSM termination is provided. When the type is not GSM, the GSM HLR relays a provide roaming number messages with the GMSC address and type to the mediation device 405. The mediation device 405 stores the GMSC address and type, converts the provide roaming number message to a location request with the GMSC ID equal to the mediation device (MD), and sends the message to the ANSI HLR 403.

The ANSI HLR sends a route request message to the ANSI VMSC with an MSC ID of MD indicating the mediation device 405. The ANSI VMSC sends an ACK including a TLDN or busy ACK to the ANSI HLR 403, which relays an ACK with a TLDN, absent, or busy to the mediation device 405. A PRN ACK with an MSRN, absent, or busy is relayed to the GSM HLR, which generates a SRI ACK including the MSRN or FTN and the IAM with the MSRN is relayed from the GSM GMSC to the ANSI VMSC processing to the mobile station. In this example, a late call forwarding invocation by the MS prevents the call from being completed from the ANSI VMSC. In one embodiment, a redirection request including a redirection reason is relayed from the ANSI VMSC to the mediation device, which queries the GSM HLR for the FTN (Forward To Number). A resume call handling message including the FTN and forwarding reason is sent to the GSM GMSC, which sends an ACK to the mediation device, which sends an ACK to the ANSI VMSC, and the IAM with the FTN is sent to the FTN VMSC. This method is

advantageous because, by granting the mediation device 405 access to the FTN, processing for call forwarded communications takes place at the originating GMSC, which saves trunking resources. Alternatively, the redirection reason may be relayed to the mediation device 405, which rejects the redirection request, causing a TRANUM (Transfer Number) request with a busy to be sent to the ANSI HLR. The ANSI HLR sends an ACK to the ANSI VMSC with the FTN, and the ANSI VMSC relays the IAM message with the FTN to the FTN VMSC. This method is advantageous because processing for call forwarded communications takes place between the MP HLR 101, and in particular the mediation device 405, and the terminating mobile switching center without having to involve the originating MSC, which may not have the ability to process a Resume Call Handling (RCH).

A flowchart and timing diagram showing call delivery originated in ANSI and terminated in GSM is shown in FIG. 8. An IAM is relayed to an ANSI GMSC, which sends a location request to the ANSI HLR 403. The ANSI HLR 403 determines whether the VMSC type is ANSI or GSM. When the type is ANSI, normal ANSI termination is provided. When the type is GSM, a route request including the GMSC address and type is relayed to the mediation device 405. The mediation device 405 stores the GMSC address (which is useful for optimal routing for late call forwarding) and the GMSC type (which is useful for Intelligent Networking (IN) interaction), and sends an SRI to the GSM HLR 401. The GSM HLR 401 issues a PRN including a GMSC address equal to the MD and sends it to the GSM VMSC, which relays an ACK with the MSRN to the GSM HLR 401, which relays the ACK with MSRN to the mediation device 405. The mediation device converts the ACK with an MSRN to an ACK with a TLDN that is relayed to the ANSI HLR 401 and to the ANSI GMSC, which relays the IAM with the TLDN to the terminating GSM VMSC. In this example, a late call forwarding invocation by the

MS prevents the call from being completed from the ANSI VMSC. The GSM VMSC sends an RCH (Resume Call Handling) including an FTN and forwarding reason to the mediation device 405 that converts the RCH to a redirection request including a redirection reason that is relayed to the ANSI GMSC, which requests a forward-to number from the ANSI HLR by sending a TRANUM request, and receives the FTN in the response, acknowledges the redirection request to the Mediation Device, and sends the IAM to the FTN VMSC. The MD acknowledges the RCH, and the process ends. This method is advantageous because, by granting the mediation device 405 access to the FTN, processing for call forwarded communications takes place between the MP HLR 101, and in particular the mediation device 405, and the originating gateway mobile switching center without having to involve an extra trunk between the originating MSC and the terminating MSC.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 4, 7, 8, 11-16, and 18 have been rejected under 35 U.S.C. § 102(e) as anticipated by Bharatia et al. (U.S. Patent No. 6,615,037; "Bharatia"). Claims 1, 34, 36 and 37 have been rejected under 35 U.S.C. § 103(a) as unpatentable over Bharatia.

VII. ARGUMENT

It is well-settled that there is no anticipation unless (1) all the same elements are (2) found in exactly the same situation and (3) are united in the same way to (4) perform the identical function. Since the Examiner's citations to each of the applied references is missing at least one element of each of applicants' independent claims, applicants respectfully submit that the claimed invention is not anticipated by the Examiner's citations to the applied references, as further discussed below.

Applicants respectfully submit that the Examiner's citations to the applied references, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied references is proper, do not teach or suggest one or more elements of the claimed invention, as further discussed below.

For explanatory purposes, applicants discuss herein one or more differences between the Examiner's citations to the applied references and the claimed invention with reference to one or more parts of the applied references. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Examiner's citations to the applied references correspond to the claimed invention.

Applicants respectfully submit that the Examiner's citations to the applied references do not teach or suggest one or more elements of the claimed invention. A careful reading of the Examiner's citations to the applied references fails to teach or suggest, for example, generating the command based on the interpretation of the first message, wherein the command is one of the set of commands utilized by the database manager, the first protocol gateway, and the second protocol gateway, as recited in applicants' independent claim 8.

Bharatia (column 4, lines 59-64) discloses converting a message:

> The IWU 14 receives the message from the ANSI-41 network 12 and, using the ANSI-41 IWU VLR functionality 210 and the GSM MAP IWU HLR functionality 220, converts the message into a GSM format. Thereafter, GSM messaging may be performed with GSM VLR to determine appropriate routing information to the roaming MS 34.

Bharatia discloses converting the message from the ANSI-41 format to the GSM format. Bharatia fails to disclose generating a command, wherein the command is one of a set of commands utilized by the ANSI-41 network, the GSM network, and the database. Simply missing from the citation to Bharatia is any mention of generating the command based on the interpretation of the first message, wherein the command is one of the set of commands utilized by the database manager, the first protocol gateway, and the second protocol gateway, as recited in applicants' independent claim 8. Thus, Bharatia fails to satisfy at least one of the limitations recited in applicants' independent claim 8.

The shortcomings of the Office Action's citation to Bharatia relative to certain elements of the claimed invention have been discussed above. Furthermore, the Examiner does not allege that the art of record provides any teaching, suggestion, or incentive for modifying the citation to Bharatia to provide the claimed approach.

For the reasons presented above with reference to claim 8, claims 1, 3, 4, 7 through 18, 34, 36, 37, 39, and 40 are believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claim 8, as well as for their own additional characterizations.

VIII. CLAIMS APPENDIX

1. A multiple-protocol home location register comprising:

a receiver for receiving, from a requesting network of at least two requesting networks, a network request according to one of at least two network protocols;

a processor, within the multiple-protocol home location register, for processing the network request utilizing a common source of data and common control procedures for the at least two network protocols to obtain information requested by the network request;

a transmitter, operably coupled to the processor, for relaying the requested information to the requesting network;

wherein the processor comprises one or more protocol gateways, operably coupled to a database that provides the common source of data, wherein the one or more protocol gateways are arranged and constructed to interpret network requests and generate, utilizing the common control procedures for the at least two network protocols, one or more queries to the database.

3. The multiple-protocol home location register of claim 1, wherein the processor comprises one or more application gateways, operably coupled to a database that provides the common source of data, wherein the one or more application gateways are arranged and constructed to interpret messages and generate, utilizing the common control procedures, one or more queries to the database.

4. A method comprising the steps of:

receiving, by a multiple-protocol home location register, a network request from a requesting network of at least two requesting networks, wherein the network request is composed according to one of at least two network protocols;

processing the network requests using a common source of data and common control procedures for the two or more protocols to obtain information requested by the network request;

relaying the requested information to the requesting network;

wherein the step of processing comprises the steps of:

interpreting the network request according to rules associated with one of the at least two network protocols;

generating a common command related to the network request;

generating at least one query related to the network request through employment of the common command and relaying the at least one query to a subscriber database;

receiving the requested information from the subscriber database.

7. The method of claim 4, wherein the step of processing further comprises the step of providing an interworking function between the two or more protocols.

8. A method comprising the steps of:

receiving, by a first protocol gateway, a first message from a first network utilizing a first network protocol of a plurality of network protocols;

interpreting the first message according to rules associated with the first network protocol;

generating a command based on the interpretation of the first message, wherein the command is one of a set of commands utilized by a database manager, the first protocol gateway, and a second protocol gateway;

generating at least one query based on the command and relaying the at least one query to a subscriber database;

receiving at least one response to the at least one query related to the first message;

relaying the at least one response to the first network.

9. The method of claim 8, further comprising the steps of:

receiving, by the first protocol gateway, a second message from a second network utilizing a second network protocol of the plurality of network protocols;

interpreting the second message according to rules associated with the second network protocol;

generating a second command based on the interpretation of the first message;

generating at least another query related to the second command and relaying the at least another query related to the message to the subscriber database;

receiving at least one response to the at least another query related to the second message;

relaying, to the second network, the at least one response to the at least another query related to the second message.

10. The method of claim 9, wherein the steps of interpreting and generating are common to the first protocol gateway and the second protocol gateway.

11. The method of claim 8, wherein the step of receiving the message terminates the network protocol.

12. The method of claim 8, wherein the rules associated with the network protocol comprise at least one communication standard.

13. The method of claim 8, wherein the plurality of network protocols comprises at least two of ANSI-41, GSM MAP, SIP, H.323, AAA, and M-IP.

14. The method of claim 8, wherein the network protocols transport at least one of voice, data, and multimedia via at least one of wireline and wireless communication media.

15. The method of claim 8, wherein the database comprises data for a plurality of communication devices and data utilized by at least two networks.

16. The method of claim 15, wherein the data comprises user profile information.

17. The method of claim 8, further comprising the steps of generating at least another query related to a message from an application server and upon receiving a response to the at least another query, relaying the response to the application server.

18. The method of claim 8, further comprising the step of providing an interworking function between the first network protocol and a second network protocol.

34. A method comprising the steps of:

receiving a message from a first network via a first protocol gateway;

processing the message according to a procedure common to the first protocol gateway, a second protocol gateway, and a database;

generating at least one database query based on the processed message;

relaying the at least one database query to the database comprising data common to a first network associated with the first protocol gateway and a second network associated with the second protocol gateway;

receiving a response to the at least one database query and generating a request to the second protocol gateway;

receiving a reply to the request to the second protocol gateway;

generating a message based on the reply;

relaying the message to the first protocol gateway.

36. The method of claim 34, wherein the response identifies the second protocol gateway.

37. The method of claim 34, wherein the response identifies a location for a communication device.

39. The method of claim 34, wherein the reply includes routing information.

40. The method of claim 39, further comprising the step of utilizing the routing information to route a call to a communication device located in a coverage area of the second network.

Respectfully submitted,

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